

Before using your multi-zone inverter mini-split system, please read this manual carefully and keep it for future reference along with your receipt.

INVERTER MULTI-ZONE HEAT PUMP MINI-SPLIT SYSTEMS



INSTALLATION MANUAL

Indoor Unit : 1PAMSCH12
1PAMSCH18
1PAMSH09-MZW-16
1PAMSH12-MZW-16
1PAMSH18-MZW-16

Outdoor Unit : 1PAMSH18-MZO2-16
1PAMSH27-MZO3-16
1PAMSH36-MZO4-16

- Please read this installation manual completely before installing the product.
- Replacement and repair work shall be performed by authorized personnel only.
- Installation work must be performed in accordance with the national wiring standards by authorized personnel only.
- Contact an authorized service technician for repair, maintenance or installation of this unit.

CONTENTS

SAFETY PRECAUTIONS

Warning	2
Caution	2

INSTALLATION INSTRUCTIONS

Selecting installation place.....	3
Wall-mounted type	3
Accessories	4
Four-way cassette type	9
Outdoor unit installation	15

REFRIGERANT PIPE CONNECTION

Refrigerant pipe connection	16
-----------------------------------	----

ELECTRICAL WORK

Electrical work	17
-----------------------	----

AIR PURGING

Air purging with vacuum pump	21
Safety and leakage check	22

TEST RUNNING

Test running	23
--------------------	----

TROUBLE SHOOTING TIPS

Trouble shooting tips	24
-----------------------------	----

Read This Manual



This manual provides the information needed for proper use and maintenance of this unit. Basic preventive care can help extend the life of this unit. The “Troubleshooting Tips” contains a chart with solutions to the most common problems. Referring to this section may save time and prevent the need for a service call in the event of a problem.

CAUTION


- Contact an authorized service technician for repair or maintenance of this unit.
- Contact an authorized installer for installation of this unit.
- The air conditioner is not intended for use by young children without supervision.
Disabled persons may require assistance with set up.
- Young children should be supervised to ensure that they do not play with the air conditioner.
- Replacement work shall be performed by authorized personnel only.
- Installation work must be performed in accordance with the national wiring standards by authorized personnel only.






SAFETY PRECAUTIONS

- Read the following SAFETY PRECAUTIONS carefully before installation.
- Electrical work must be installed by a licensed electrician. Be sure to use the correct rating of the power plug and main circuit for the model to be installed.
- Incorrect installation due to ignoring of the instructions will cause harm or damage.
 - **The seriousness is classified by the following indications.**

 WARNING	This symbol indicates the possibility of death or serious injury.
 CAUTION	This symbol indicates the possibility of injury or damage to property.

- **The items to be followed are classified by the symbols:**

	Symbol with white background denotes item that is PROHIBITED from doing.
---	--

 WARNING	
1) Engage dealer or specialist for installation. If installation done by the user is defective, it will cause water leakage, electrical shock or fire.	
2) Install according to these installation instructions strictly. If installation is defective, it will cause water leakage, electrical shock or fire.	
3) Use the attached accessories parts and specified parts for installation. Otherwise, it will cause the set to fall, water leakage, electrical shock or fire.	
4) Install at a strong and firm location which is able to withstand the set's weight. If the strength is not enough or installation is not properly done, the set will drop and cause injury.	
5) For electrical work, follow the local national wiring standard, regulation and these installation instructions. An independent circuit and single outlet must be used. If electrical circuit capacity is not enough or defect found in electrical work, it will cause electrical shock or fire.	
6) Use the specified cable and connect tightly and clamp the cable so that no external force will be acted on the terminal. If connection or fixing is not proper, it will cause heat-up or fire at the connection.	
7) Wiring routing must be properly arranged so that control board cover is fixed properly. If control board cover is not fixed properly, it will cause heat-up at connection point of terminal, fire or electrical shock.	
8) When carrying out piping connection, take care not to let air substances other than the specified refrigerant go into refrigeration cycle. Otherwise, it will cause lower capacity, abnormal high pressure in the refrigeration cycle, explosion and injury.	
9) Do not modify the length of the power supply cord or use of extension cord, and do not share the single outlet with other electrical appliances. Otherwise, it will cause fire or electrical shock.	
 CAUTION	
1) This equipment must be grounded and installed with grounding leakage current breaker. It may cause electrical shock if grounding is not proper.	
2) Do not install the unit at place where leakage of flammable gas may occur. In case gas leaks and accumulates at surrounding of the unit, it may cause fire.	
3) Carry out drainage piping as mentioned in installation instructions. If drainage is not proper, water may enter the room and damage the furniture.	

1. Wall-mounted type

Selecting installation place

Read completely, then follow step by step.

Indoor unit

- Do not expose the indoor unit to heat or steam.
- Select a place where there are no obstacles in front or around the unit.
- Make sure that condensation drainage can be conveniently routed away.
- Do not install near a doorway.
- Ensure that the space on the left and right of the unit is more than 5 inches (12cm).
- Use a stud finder to locate studs to prevent unnecessary damage to the wall.
- The indoor unit should be installed on the wall at a height of 7 feet (2.0 m) or more from the floor.
- The indoor unit should be installed allowing a minimum clearance of 6 inches (15cm) from the ceiling.
- Any variations in pipe length will/may require adjustment to refrigerant charge.
- There should not be any direct sunlight. Otherwise, the sun will fade the plastic cabinet and affect its appearance. If unavoidable, sunlight prevention should be taken into consideration.

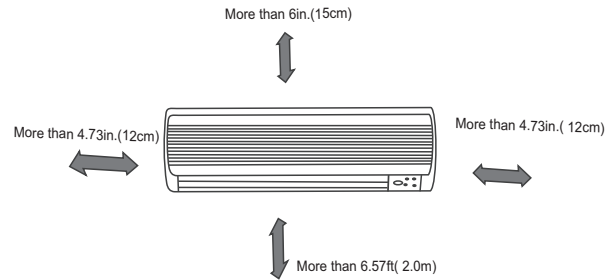


Fig.1

Outdoor unit

- If an awning is built over the outdoor unit to prevent direct sunlight or rain exposure, make sure that heat radiation from the condenser is not restricted.
- Ensure that the clearance around the back of the unit is more than 12 inches (30cm) and left side is more than 12 inches (30cm). The front of the unit should have more than 7 feet (2m) of clearance and the connection side (right side) should have more than 24 inches (60cm) of clearance.
- Do not place animals and plants in the path of the air inlet or outlet.
- Take the air conditioner weight into account and select a place where noise and vibration will not be an issue.
- Select a place so that the warm air and noise from the air conditioner do not disturb neighbors.

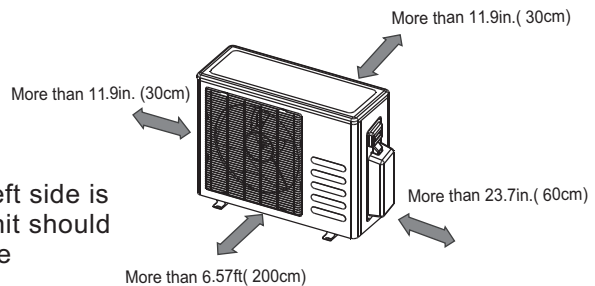


Fig.2

Rooftop installation:

- If the outdoor unit is installed on a roof structure, be sure to level the unit.
- Ensure the roof structure and anchoring method are adequate for the unit location.
- Consult local codes regarding rooftop mounting.
- If the outdoor unit is installed on roof structures or external walls, this may result in excessive noise and vibration, and may also be classed as a non serviceable installation.

INSTALLATION INSTRUCTIONS

Tools needed for installation:

Level gauge
 Screwdriver
 Electric drill, Hole core drill (2.5 inches (65mm))
 Flaring tool set
 Specified torque wrenches: 13.0 lb.ft., 30.4 lb.ft.,
 39.8 lb.ft., 47.7 lb.ft. (different depending on model No.)
 Spanner (half union)
 Service wrench
 Gas-leak detector

Vacuum pump
 Gauge manifold
 Users manual
 Thermometer
 Multimeter
 Pipe cutter
 Measuring tape

Parts List

Number	Name of Part			Qty/one unit
1	Installation Plate			1
2	Plastic Expansion Sheath			5-8 (depending on models)
3	Self-Tapping Screw A ST3.9X25			5-8 (depending on models)
4	Connecting Pipe Assembly	Liquid side	Φ 1/4 " (6.35mm)	Parts you must purchase Consult the technician for the proper size.
		Gas side	Φ 3/8 " (9.53mm)	
			Φ 1/2 " (12.7mm)	
5	Remote Control			1
6	Self-tapping Screw B ST2.9X10			2
7	Remote Control Holder			1
8	Seal (for cooling& heating models only)			1
9	Drain Joint (for cooling& heating models only)			1
10	Transfer connector(Packed with the indoor unit) (NOTE: Pipe size differs from appliance to appliance. To meet different pipe size requirement, sometimes the pipe connections need the transfer connector to install on the outdoor unit .)			1 (on some models)

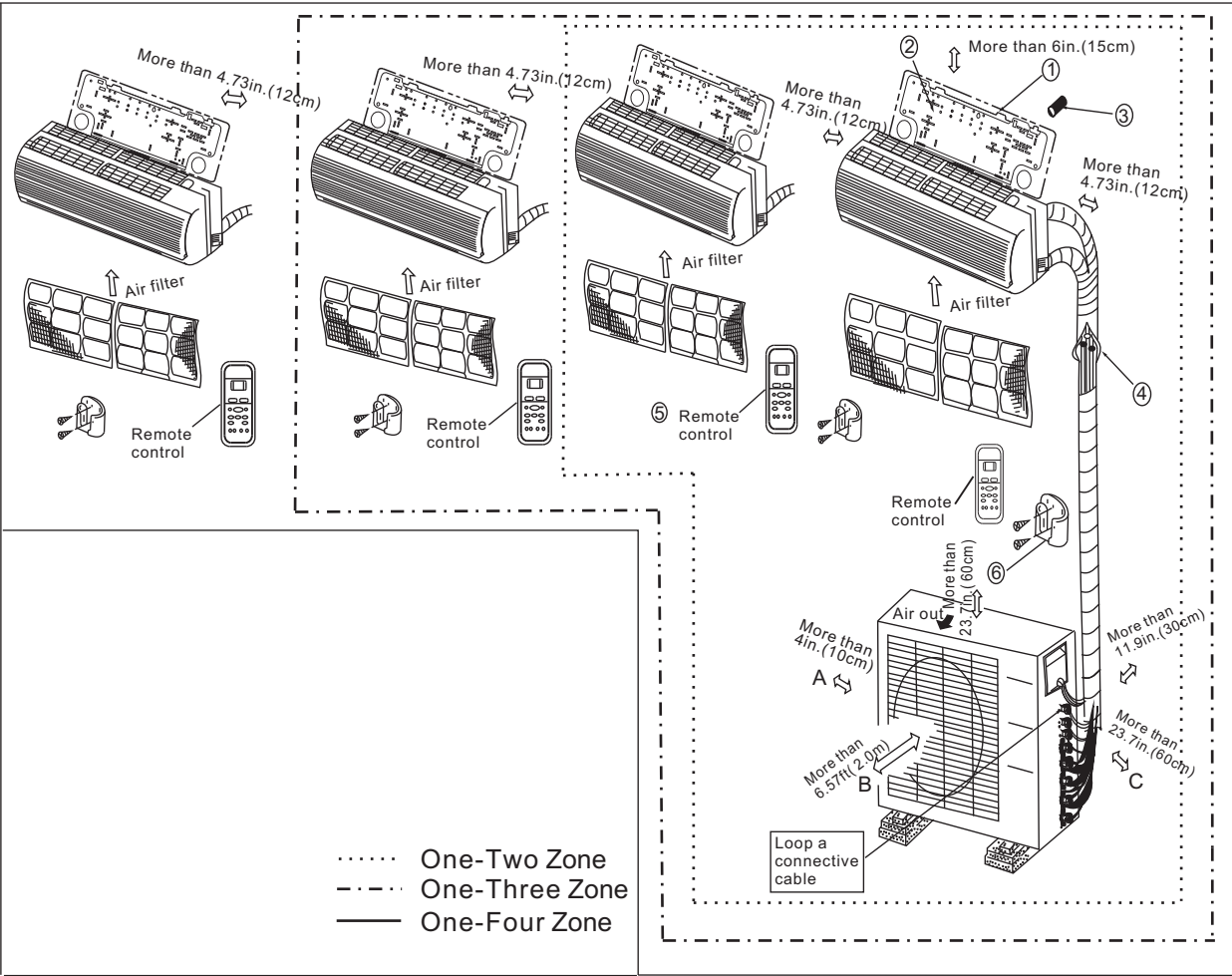


Fig.3

CAUTIONS

- This illustration is for explanation purposes only. The actual shape of your air conditioner may be slightly different.
- Copper lines must be insulated independently.

CAUTION

- Use a stud finder to locate studs to prevent unnecessary damage to the wall.
- A minimum pipe run of 10ft (3m) is required to minimize vibration & excessive noise.
- Two of the A, B and C directions should be free from obstructions.

INSTALLATION INSTRUCTIONS

Indoor unit installation (wall-mounted type)

1. Fit the Installation Plate

1. Fit the installation plate horizontally on structural parts of the wall with spaces around the installation plate.
2. If the wall is made of brick, concrete or the like, drill five or eight 0.197 inches (5mm) diameter holes in the wall. Insert Clip anchor for appropriate mounting screws.
3. Fit the installation plate on the wall with five or eight type "A" screws.

Note:

Fit the Installation Plate and drill holes in the wall according to the wall structure and corresponding mounting points on the installation plate. The Installation Plate may be slightly different according to the different models of indoor unit.

(Dimensions are in "inch" unless otherwise stated)

Correct orientation
of Installation Plate

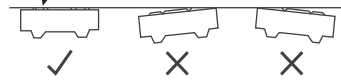


Fig.4

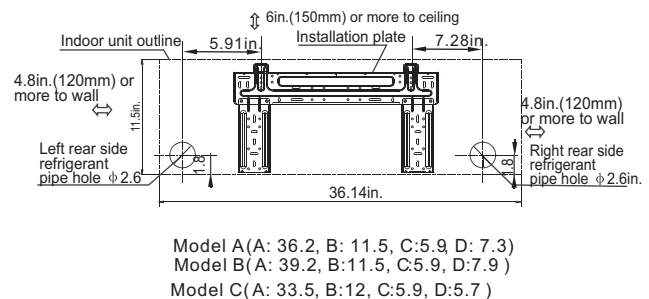
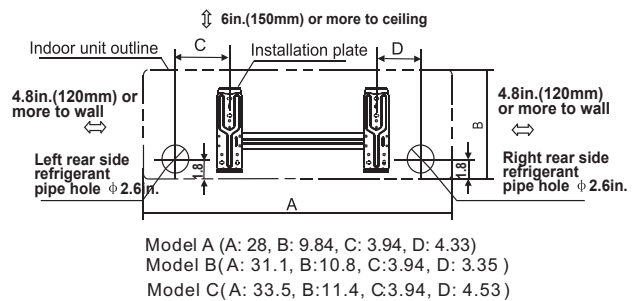
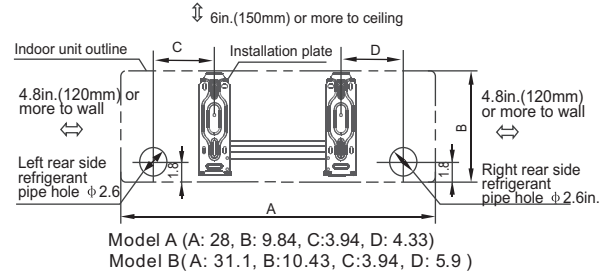


Fig.5

2. Drill a hole in the wall

1. Determine hole positions according to the diagram detailed in Fig.5. Drill one (1) hole (2.5 inches (65mm)) slanting slightly to outdoor side.

3. Connective Pipe and Drainage Installation

Drainage

1. Run the drain hose sloping downward. Do not install the drain hose as illustrated in Fig.7.

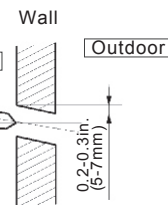


Fig.6

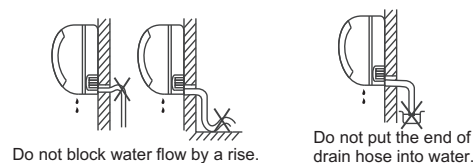


Fig.7

INSTALLATION INSTRUCTIONS

- When connecting extension drain hose, insulate the connecting part of extension drain hose with a shield pipe, do not let the drain hose slack.

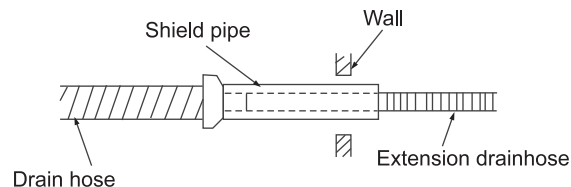


Fig.8

Connective pipe installation

- For the left-hand and right-hand piping, remove the pipe cover from the side panel.
- For the rear-right-hand and rear-left-hand piping, install the piping as shown in Fig.10.
- Fix the end of the connective pipe. (Refer to Tightening Connection in REFRIGERANT PIPING CONNECTION)

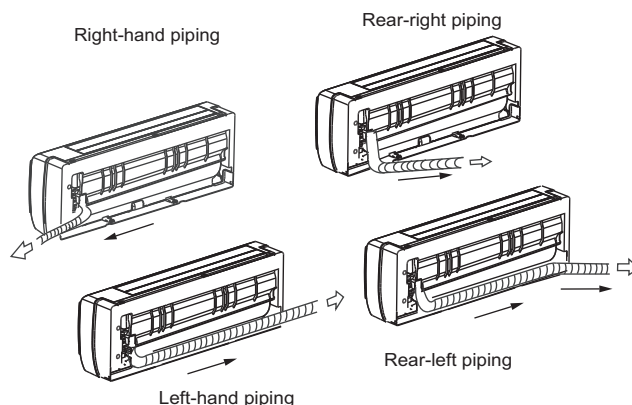


Fig.9

Fig.10

4. Piping and wrapping

Bundle the tubing, connecting cable, and drain hose with tape securely, evenly as shown in Fig.11.

- Because the condensed water from rear of the indoor unit is gathered in evaporative drain pan box and is piped out of room do not put anything else in the box.

CAUTION

- Connect the indoor unit first, then the outdoor unit.
- Do not allow the piping to let out from the back of the indoor unit.
- Be careful not to let the drain hose slack.
- Heat insulated both of the auxiliary piping.
- Be sure that the drain hose is located at the lowest side of the bundle. Locating at the upper side can cause drain pan to overflow inside the unit.
- Never intercross nor intertwist the power wire with any other wiring.
- Run the drain hose sloped downward to drain out the condensed water smoothly.

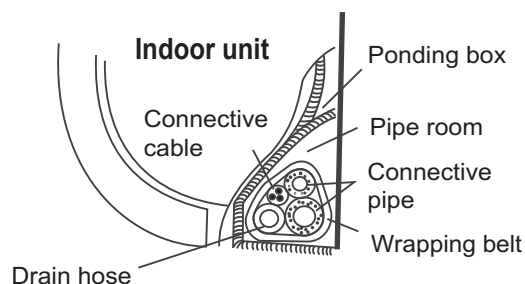


Fig.11

INSTALLATION INSTRUCTIONS

4. Indoor unit installation

1. Pass the piping through the hole in the wall.
2. Put the upper claw at the back of the indoor unit on the upper hook of the installation plate, move the indoor unit from side to side to see that it is securely hooked (see Fig.12).
3. Piping can easily be made by lifting the indoor unit with a cushioning material between the indoor unit and the wall. Remove after finished piping.
4. Push the lower part of the indoor unit up on the wall, then move the indoor unit from side to side, up and down to check if it is hooked securely.

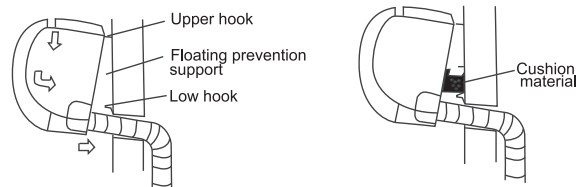


Fig.12




Indoor units that can be used in combination	Number of connected units	1 - 4 units
	Total of indoor units class KW	10.5KW
Compressor stop/start frequency	1 cycle time	6 min or more (from stop to stop or from start to start)
	Stop time	3 min or more
Power source voltage	Voltage fluctuation	within $\pm 10\%$ of rated voltage
	Voltage drop during start	within $\pm 15\%$ of rated voltage
	Interval unbalance	within $\pm 3\%$ of rated voltage

		2 Zone	3 Zone	4 Zone
Max. Length for all rooms		98 feet	148 feet	197 feet
Max. Length for one indoor unit		66 feet	82 feet	98 feet
Max. height different between indoor and outdoor unit	OU higher than IU	33 feet	33 feet	33 feet
	OU lower than IU	49 feet	49 feet	49 feet
Max. height different between indoor units		33 feet	33 feet	33 feet

2. Four-way cassette type

Attached fittings

Please check whether the following fittings are of full scope. If there are some attached fittings free from use, please restore them carefully.

	(on some models)	(on some models)
1. Installation manual.....1	5. Outlet pipe sheath1	11. Expansible hook.....4
2. Owner's manual.....1	6. Outlet pipe Clasp1	12. Installation hook.....4
3. Remote Control.....1	7. Drain joint1	13. Orifice.....1
	8. Installation paper board.....1	14. Frame.....1
4. Alkaline dry batteries (AM4).....2		15. Mounting screw (ST2.9×10-C-H) ...2
	9. Soundproof / insulation sheath.....1	
	10. Seal ring.....1	

Notes before installation

1. Decide the correct carry-in path.
2. Move this unit as originally packaged as possible.
3. If the air conditioner is installed on a metal part of the building, it must be electrically insulated according to the relevant electrical code.
4. If installing phase protectors at a high position where it is hot and humid with frequent thunderstorms, lightning-protection equipment is necessary.

Indoor unit installation

1. Install the main body

- A. The existing ceiling (to be horizontal)
 - a. Please cut a square hole of 24 x 24 inches in the ceiling according to the shape of the installation paper board. (Refer to Fig.15 & 16)
 - The center of the hole should be at the same position of that of the air conditioner body.
 - Determine the lengths and outlets of the connecting pipe, drain pipe and cables.
 - To balance the ceiling and to avoid vibration, please enforce the ceiling when necessary.
- b. Please select the position of installation hooks according to the hook holes on the installation board.
 - Drill four holes of 0.5 inches (12mm), 2.5 inches (50~55mm) deep at the selected positions on the ceiling. Then embed the expansible hooks (fittings).
 - Face the concave side of the installation hooks toward the expansible hooks. Determine the length of the installation hooks from the height of ceiling, then cut off the unnecessary part.
 - If the ceiling is extremely high, please determine the length of the installation hook according to facts.

Necessary room

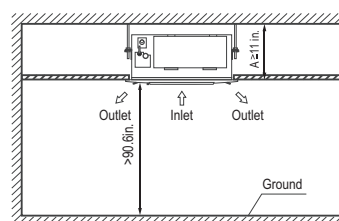


Fig.13

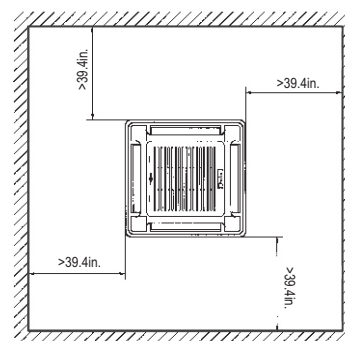


Fig.14

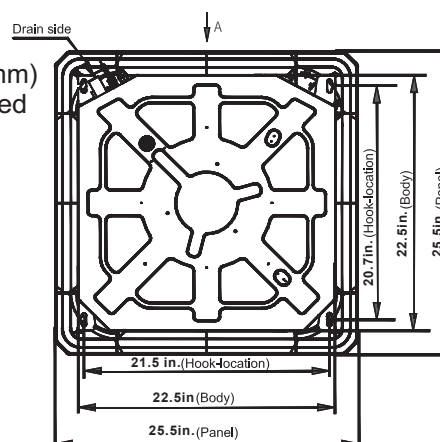


Fig.15

INSTALLATION INSTRUCTIONS

The length could be calculated from Fig.17:

Length = 8.3 inches + L (in general, L is half of the whole length of the installation hook)

- c. Please adjust the hexangular nuts on the four installation hooks evenly, to ensure the balance of the body.
- Properly level the unit to check the level of the main body from the four sides or diagonal line direction, the level indicator also can check the level from four sides of the main body. (Refer to Fig.18)
- If the drainpipe is not level, leakage will be caused by the malfunction of the water-level switch.
- Adjust the position to ensure the gaps between the body and the four sides of ceiling are even.
- The body's lower part should recess into the ceiling for 3/8 inches (10~12mm) (Refer to Fig.17).

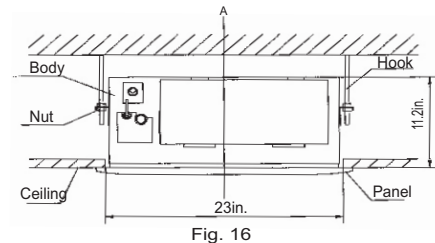


Fig. 16

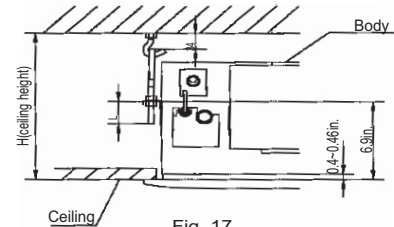


Fig. 17

New built houses and ceilings

- a. In the case of new built house, the hook can be embedded in advance (refer to the A.b mentioned above). But it should be strong enough to bear the indoor unit and will not become loose because of concrete shrinking.
- b. Refer to the A.c mentioned above for installation.
- c. Remove the installation template.

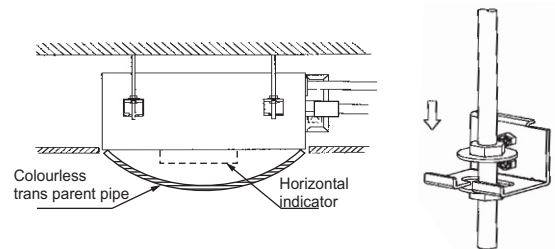


Fig.18

Fig.19

2. Install The Panel

CAUTIONS

(1) Remove the inlet grid.

- a. Slide two grid switches toward the middle at the same time, and then pull them up. (Refer to Fig.21)
- b. Draw the grid up to an angle of about 30°, and remove it. (Refer to Fig.22)

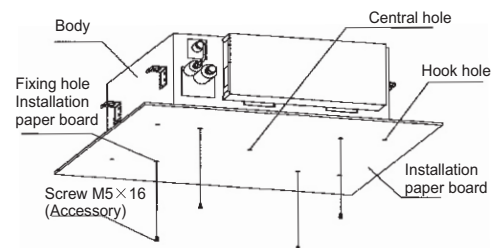


Fig.20

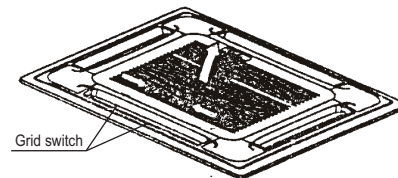


Fig.21

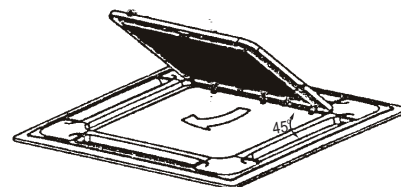


Fig.22

INSTALLATION INSTRUCTIONS

(2) Install the panel

- Align the swing motor on the panel to the water receiver of the body properly. (Refer to Fig.23)
- Hang the four fixed ropes of the main body to the installation cover and the other three covers of the swing motor: (Refer to Fig.23)

CAUTIONS

The installation cover of the swing motor must sink into the corresponding water receiver.

- Install the panel on the main body with bolt (M5×16) and washer. (Refer to Fig.23)
- Adjust the four panel hook screws to keep the panel horizontal, and screw them up to the ceiling evenly.
- Regulate the panel in the direction of the arrow in Fig.11 slightly to fit the panel's center to the center of the ceiling's opening. Confirm that hooks of four corners are fixed well.
- Keep fastening the screws under the panel hooks, until the thickness of the sponge between the body and the panel's outlet has been reduced to about 0.16~0.24 inches (4~6mm). The edge of the panel should contact with the ceiling well. (Refer to Fig.24)

Do not over tighten the screw. (Fig.25)

If the gap between the panel and ceiling still exists after fastening the screws, the height of the indoor unit should be modified again. You can modify the height of the indoor unit through the openings on the panel's four corners, if the lift of the indoor unit and the drainpipe is not influenced (refer to Fig.26-right).

- Hang the air-in grid to the panel, then connect the lead terminator of the swing motor and that of the control box with corresponding terminators on the body respectively.
- Relocate the air-in grid in the procedure of reversed order, install the air-in grid.

(3) The installation of ventilation motor and ventilation pipe (if necessary)

- Using a tool to knock off the pre-punching hole. (Refer to Fig.27)
- Four screw reserved for installation. (Refer to Fig.27)

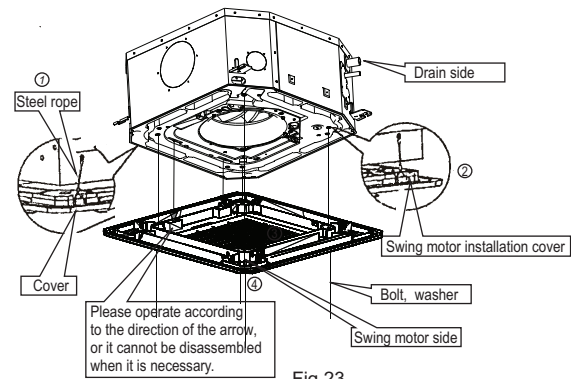


Fig.23

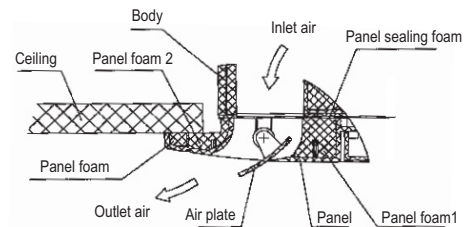


Fig.24

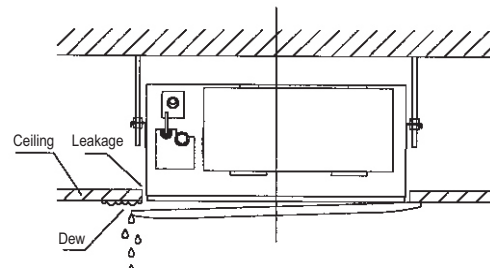


Fig.25

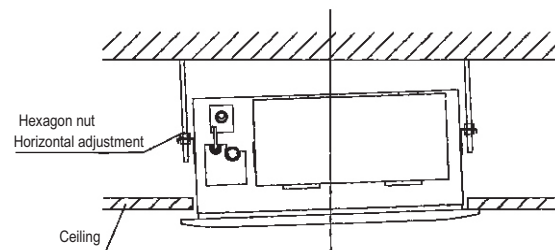


Fig.26

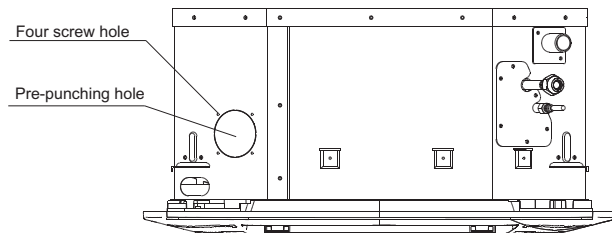


Fig.27

INSTALLATION INSTRUCTIONS

(4) Water-pump drainage

The maximum lifting height is 29.5 inches.

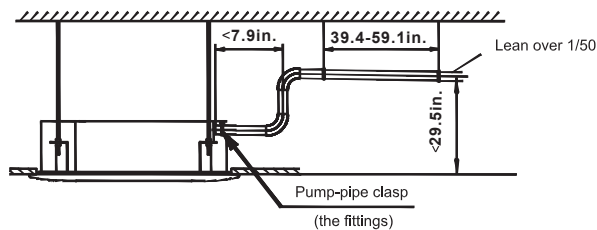


Fig.28

3. Drainage pipe installation

(1) Installation principle

- Ensure at least 1/100 slope of the drainage pipe.
- Adopt suitable pipe diameter.
- Adopt nearby condensate water discharge.
- Before installing condensate water pipeline, determine its route and elevation to avoid intersection with other pipelines and ensure slope is straight.
- Support drain link per code.

(2) Drainage pipe selection

- The drainage pipe diameter shall not be smaller than the drain hose of indoor unit.
- According to the water flowrate and drainage pipe slope to choose the suitable pipe, the water flowrate is decided by the capacity of indoor unit.

Capacity(x1000Btu)	Water flowrate(g/h)
12	2.4
18	4
24	6
30	7
36	8
42	10
48	12
60	14

INSTALLATION INSTRUCTIONS

For horizontal drainage pipe (The following table is for reference)

Attention: Use DWV/PVC40 or bigger pipe to be the main pipe according to code.

- The horizontal pipe layout should avoid converse flow or bad flow:

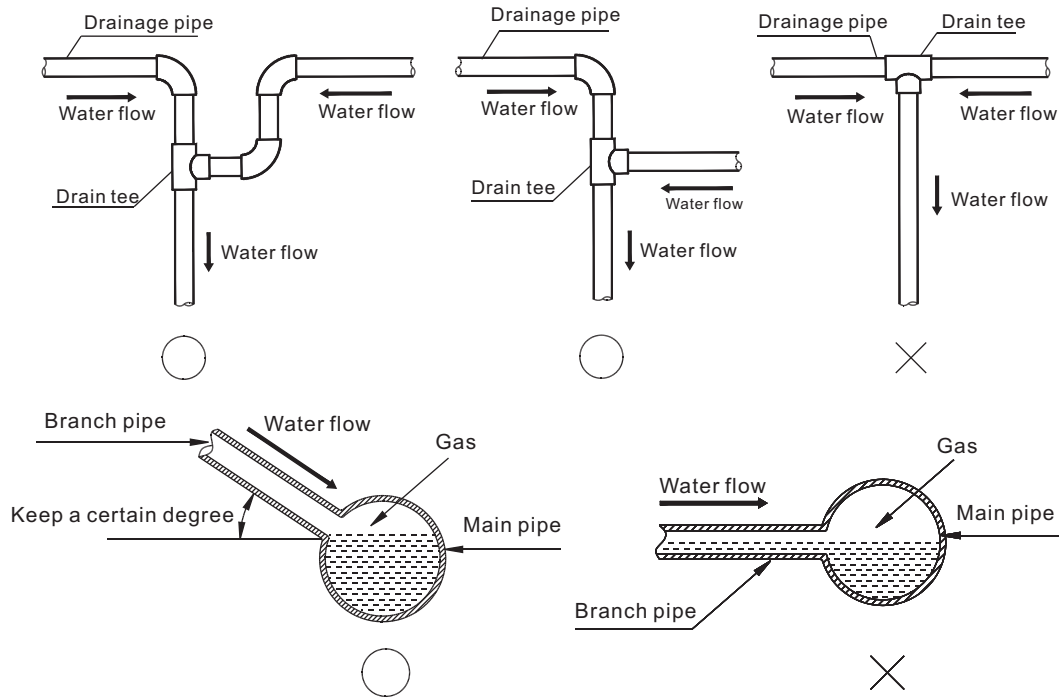


Fig.30

INSTALLATION INSTRUCTIONS

(3) Water storage pipe setting

- If the indoor unit has high extra static pressure and without water pump to elevate the condensate water, such as high extra static pressure duct unit, the water storage pipe should be set to avoid converse flow or blow water phenomena.

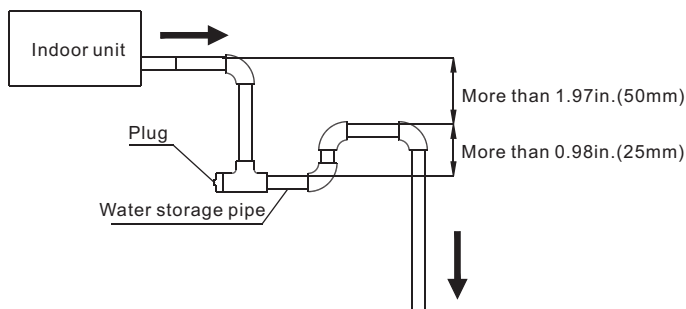


Fig.31

(4) Lifting pipe setting of indoor unit with water pump

- The length of lifting pipe should not exceed the pump head of indoor unit water pump.
- Pump head of big four way cassette: 29.5 inches (750mm).
- Pump head of compact four way cassette: 19.7 inches (500mm) (9k, 12k, 18k units).
- The drainage pipe should be set down inclined after the lifting pipe immediately to avoid wrong operation of water level switch.
- Refer to the following picture for installation reference.

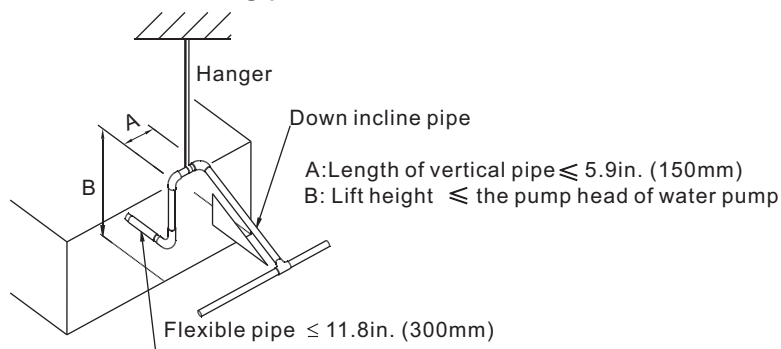


Fig.32

(5) Ventline setting

- For the concentrated drainage pipe system, there should design a blowhole at the highest point of main pipe to ensure the condensate water discharge smoothly. The air outlet shall face down to prevent dirt entering pipe. Each indoor system should be installed with it. The installation should consider the convenience for future cleaning.

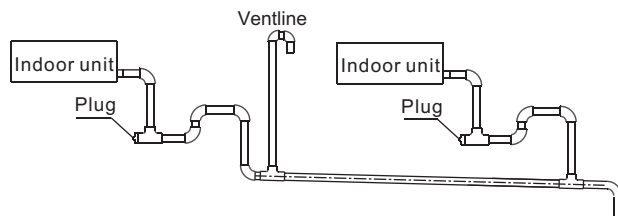


Fig.33

INSTALLATION INSTRUCTIONS

Outdoor unit installation

Outdoor installation precaution

- Install the outdoor unit on a rigid base to prevent increasing noise level and vibration.
- Determine the air outlet direction where the discharged air is not blocked. In the case that the installation place is exposed to strong wind such as a seaside, make sure the fan is operating properly by putting the unit lengthwise along the wall or using dust or shield plates.
- In windy area, install the unit to prevent the admission of wind. If need suspending installation, the installation bracket should accord with technique requirement in the installation bracket diagram.
- The installation wall should be solid brick, concrete or the same intensity construction, or actions to reinforce, damping supporting should be taken. The connection between bracket and wall, bracket and the air conditioner should be firm, stable and reliable.
- Be sure there is no obstacle which block radiating air.

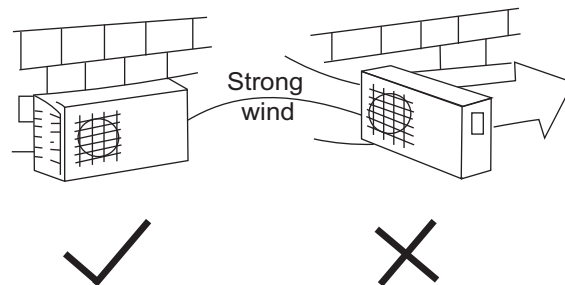


Fig.51

Settlement of outdoor unit

- Anchor the outdoor unit with a bolt and nut $\phi 0.4$ inches or $\phi 0.3$ inches tightly and horizontally on a concrete or rigid mount.

Outdoor unit dimension inches/mm(L1xHxW1)	Mounting dimensions	
	L2 (in./mm)	W2 (in./mm)
30x23.3x11.3/ 760x590x285	20.9/ 530	11.5/ 290
33.3x27.6x12.6/ 845x700x320	22.1/ 560	13.2/ 335
35.3x33.9x12.5/ 900x860x315	23.3/ 590	13.1/ 333
39x38x13.6/ 990x965x345	24.6/ 624	14.4 366

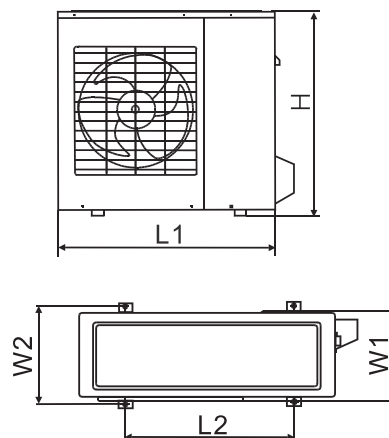


Fig.52

Drain joint installation

NOTE: The drain joint differs from appliance to appliance.

Fit the seal into the drain joint, then insert the drain joint into the base pan hole of outdoor unit, rotate 90° to securely assemble them. Connecting the drain joint with an extension drain hose (locally purchased), in case of the water draining off the outdoor unit during the heating mode.

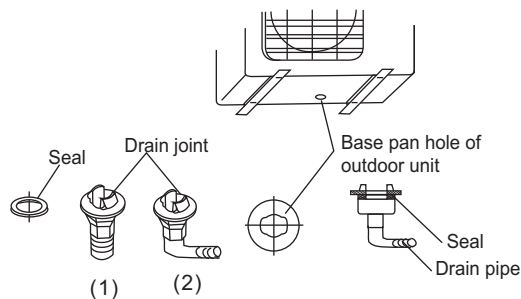


Fig.53

1. Flaring work

Main cause for refrigerant leakage is due to defect in the flaring work.

Carry out correct flaring work using the following procedure:

A: Cut the pipes and the cable.

1. Use the piping kit accessory or pipes purchased locally.
2. Measure the distance between the indoor and the outdoor unit.
3. Cut the pipes a little longer than the measured distance.
4. Cut the cable 59.1 inches (1.5m) longer than the pipe length.

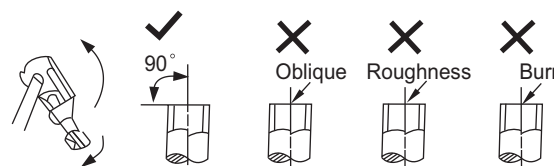


Fig.54

B: Burr removal

1. Completely remove all burrs from the cut cross section of pipe/tube.
2. Put the end of the copper tube/pipe in a downward direction as you remove burrs in order to avoid dropping burrs into the tubing.

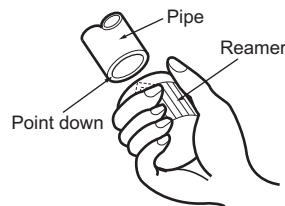


Fig.55

C: Putting nut on

Remove flare nuts attached to indoor and outdoor unit, then put them on pipe/tube having completed burr removal. (Not possible to put them on after flaring work)

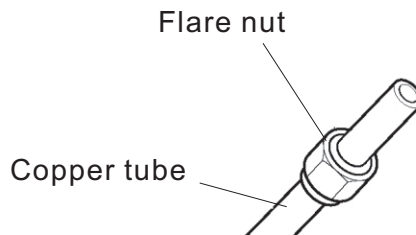


Fig.56

D: Flaring work

Firmly hold copper pipe in a die in the dimension shown in the table below.

Outer diam. Inches (mm)	A (inches/mm)	
	Max.	Min.
φ 1/4 " (6.35)	0.052/1.3	0.03/0.7
φ 3/8 " (9.53)	0.062/1.6	0.04/1.0
φ 1/2 " (12.7)	0.071/1.8	0.04/1.0

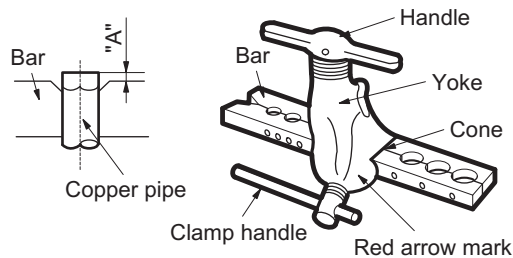


Fig.57

Tightening Connection

- Align the center of the pipes.
- Sufficiently tighten the flare nut with fingers, and then tighten it with a spanner and torque wrench as shown in Fig.58 & 59

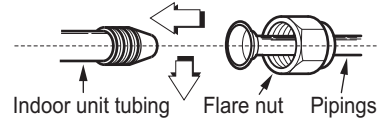


Fig.58

Outer diam.	Tightening torque (lb.ft.)	Additional tightening torque (lb.ft.)
φ 1/4 "	11.1 lb.ft.	11.8 lb.ft.
φ 3/8 "	18.4 lb.ft.	19.2 lb.ft.
φ 1/2 "	25.8 lb.ft.	26.5 lb.ft.

Caution

- Excessive torque can break nut depending on installation conditions.

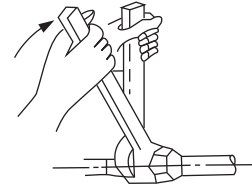


Fig.59

Electrical work

Electric safety regulations for the initial Installation

1. If there is serious safety problem about the power supply, the technicians should refuse to install the air conditioner and explain to the client until the problem is solved.
2. Power voltage should be in the range of 90%~110% of rated voltage.
3. The creepage protector and main power switch with a 1.5 times capacity of Max. Current of the unit should be installed in power circuit.
4. Ensure the air conditioner is grounded well.
5. According to the attached Electrical Connection Diagram located on the panel of the outdoor unit to connect the wire.
6. All wiring must comply with local and national electrical codes and be installed by qualified and skilled electricians.
7. An individual branch circuit and single receptacle used only for this air conditioner must be available.

Wiring connection

NOTE: Before performing any electrical work, turn off the main power to the system.



CAUTIONS

- Do not touch the capacitor even if you have disconnected the power for there is still high voltage power on it, or electric shock hazard may occur. For your safety, you should start repairing at least 5 minutes after the power is disconnected.
- The power is supplied from the Outdoor Unit. The Indoor Units are connected with signal wires or power cords are connected reliably and correctly, or the air conditioner could not run normally.

Minimum nominal cross-sectional area of conductors:

Rated current of appliance (A)	Nominal cross-sectional area (mm ²)
>3 and ≤6	0.75
>6 and ≤10	1
>10 and ≤16	1.5
>16 and ≤25	2.5

Suggest Minimum Wire Size (AWG: American Wire Gage):

Appliance Amps	AWG Wire Size
10	18
13	16
18	14
25	12
30	10

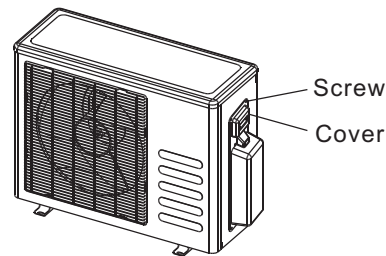


Fig.61

Connect the cable to the outdoor unit

- Remove the electrical control board cover from the outdoor unit by loosening the screw as shown in Fig.61
- Connect the connective cables to the terminals as identified with their respective matched numbers on the terminal block of indoor and outdoor units.
- Secure the cable onto the control board with the cord clamp.

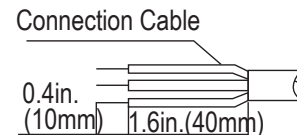
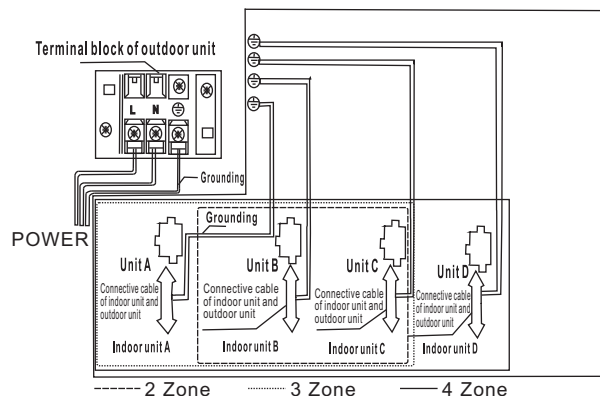


Fig.62



CAUTIONS

Make sure to connect the indoor unit (A, B, C, D) to the Hi and Lo valve and terminals of signal wires (A, B, C, D) of outdoor unit as identified with their respective matched connection. Wrong wiring connections may cause some electrical parts to malfunction.



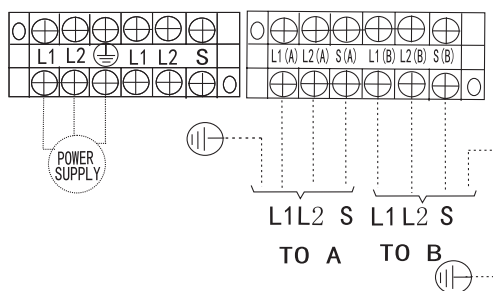
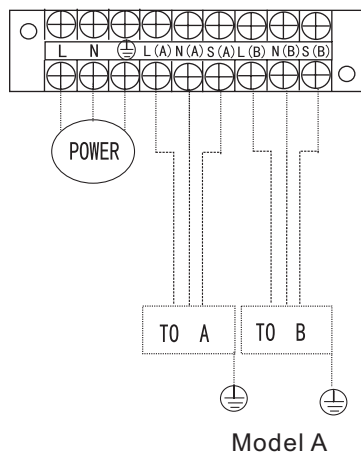
ELECTRICAL WORK

NOTE: please refer to the following figures, if the client wants to wire by themselves.

Outdoor

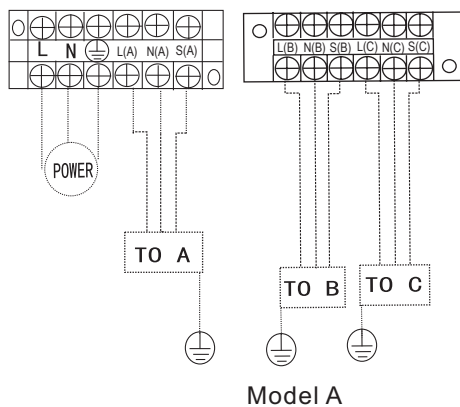
Indoor

One-two models:

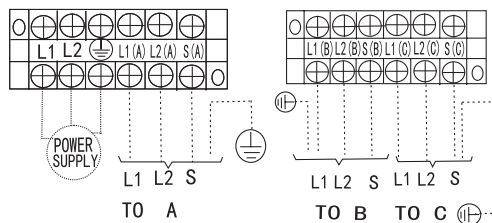


Model B

One-three models:

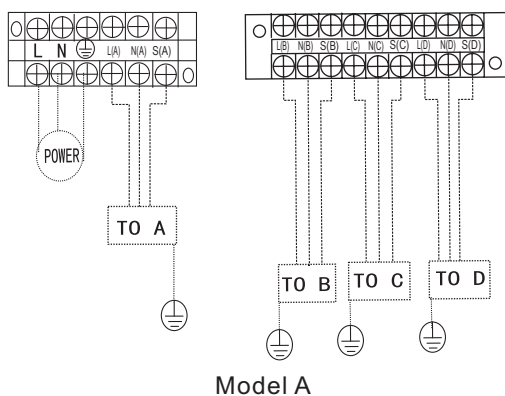


Model A

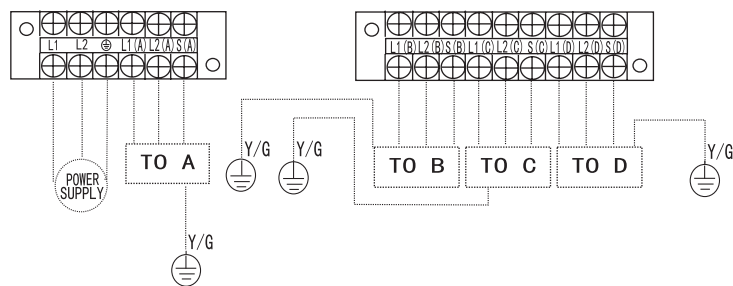


Model B

One-four models:



Model A



Model B

Fig.63

CAUTION

Prepare the wiring as follows:

- 1) **Never fail to have an individual power circuit specifically for the air conditioner. As for the method of wiring, be guided by the circuit diagram posted on the inside of control cover.**
- 2) **The screws which fasten the wiring in the casing of electrical fittings are liable to come loose from vibrations to which the unit is subjected during the course of transportation. Check them and make sure that they are all tightly fastened. (If they are loose, it could cause burn-out of the wires.)**
- 3) **Specification of power source.**
- 4) **Confirm that electrical capacity is sufficient.**
- 5) **See to it that the starting voltage is maintained at more than 90 percent of the rated voltage marked on the name plate.**
- 6) **Confirm that the cable thickness is as specified in the power source specification.**
- 7) **Always install a ground leakage circuit breaker in a wet or moist area.**
- 8) **The following would be caused by voltage drop.**
Vibration of a magnetic switch, which will damage the contact point, fuse breaking, disturbance of the normal function of the overload.
- 9) **The means for disconnection from a power supply shall be incorporated in the fixed wiring and have an air gap contact separation of at least 0.12 inches (3mm) in each active (phase) Conductors.**

AIR PURGING

Air purging

Air and moisture in the refrigerant system have undesirable effects as indicated below:

- Pressure in the system rises.
- Operating current rises.
- Cooling or heating efficiency drops.
- Moisture in the refrigerant circuit may freeze and block capillary tubing.
- Water may lead to corrosion of parts in the refrigeration system.

Therefore, the indoor unit and tubing between the indoor and outdoor unit must be leak tested and evacuated to remove any noncondensables and moisture from the system.

Air purging with vacuum pump

- Preparation
Check that each tube (both liquid and gas side tubes) between the indoor and outdoor units have been properly connected and all wiring for the test run has been completed. Remove the service valve caps from both the gas and the liquid side on the outdoor unit. Note that both the liquid and the gas side service valves on the outdoor unit are kept closed at this stage.
- Pipe length and refrigerant amount:

Connective pipe length	Air purging method	Additional amount of refrigerant to be charged
Less than 16.41 feet (5m)	Use vacuum pump.	_____
More than 16.41 feet (5m)	Use vacuum pump.	0.212 oz/ft

- When relocating the unit to another place, perform evacuation using vacuum pump.
- Make sure the refrigerant added into the air conditioner is liquid form in any case.

Caution in handling the packed valve

- Open the valve stem until it hits against the stopper. Do not try to open it further.
- Securely tighten the valve stem cap with a Crescent Wrench and Service Valve Wrench.
- Valve stem cap tightening torque (See Tightening Torque Table in previous page).

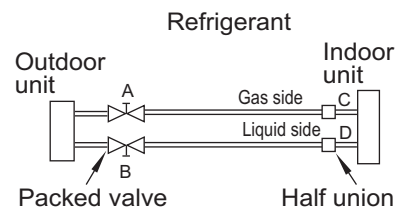


Fig.65

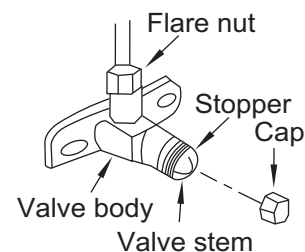


Fig.66

When Using the Vacuum Pump

(For method of using a manifold valve, refer to its operation manual.)

1. Completely tighten the flare nuts, A, B, C, D, connect the manifold valve charge hose to a charge port of the low-pressure valve on the gas pipe side.
2. Connect the charge hose connection to the vacuum pump.
3. Fully open the handle Lo of the manifold valve.
4. Operate the vacuum pump to evacuate. After starting evacuation, slightly loosen the flare nut of the Lo valve on the gas pipe side and check that the air is entering (operation noise of the vacuum pump changes and a compound meter indicates 0 instead of minus).
5. After the evacuation is complete, fully close the handle Lo of the manifold valve and stop the operation of the vacuum pump. Make evacuation for 15 minutes or more and check that the compound meter indicates -76cmHg (-1x10⁵Pa).
6. Turn the stem of the packed valve B about 45° counterclockwise for 6~7 seconds after the gas coming out, then tighten the flare nut again. Make sure the pressure display in the pressure indicator is a little higher than the atmosphere pressure.
7. Remove the charge hose from the Low pressure charge hose.
8. Fully open the packed valve stems B and A.
9. Securely tighten the cap of the packed valve.

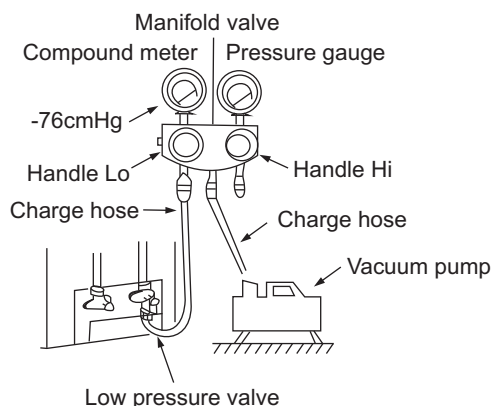


Fig.67

Safety and leakage check

● Electrical safety check

Perform the electric safe check after completing installation:

1. Insulated resistance
The insulated resistance must be more than 2MΩ.
2. Grounding work
After finishing grounding work, measure the grounding resistance by visual detection and grounding resistance tester. Make sure the grounding resistance is less than 4Ω.
3. Electrical leakage check (performing during test running)
During test operation after finishing installation, the serviceman can use the electroprobe and multimeter to perform the electrical leakage check. Turn off the unit immediately if leakage happens. Check and find the solution until the unit operates properly.

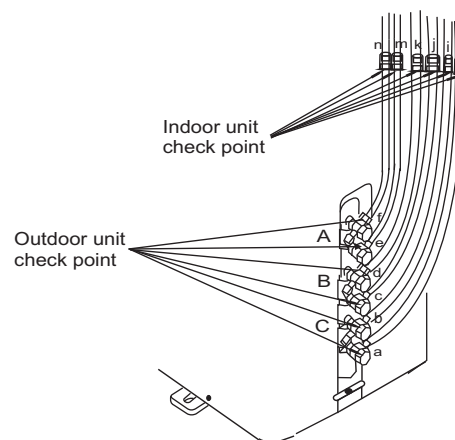


Fig.68

● Gas leak check

1. Soapy water method:

Apply a soapy water or a liquid neutral detergent on the indoor unit connection or outdoor unit connections by a soft brush to check for leakage of the connecting points of the piping. If bubbles come out, the pipes have leakage.

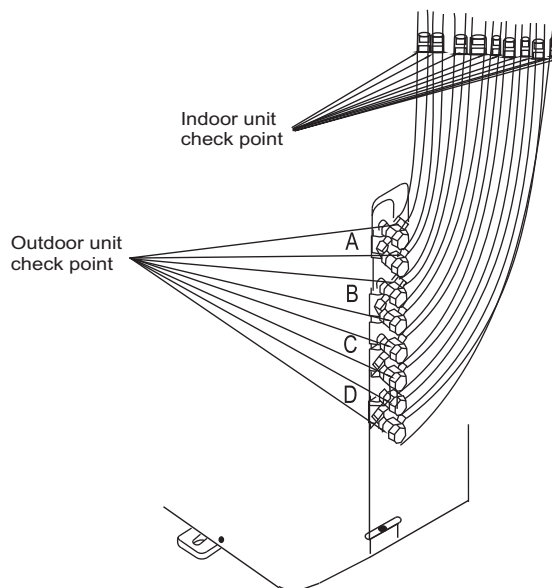
2. Leak detector

Use the leak detector to check for leakage.

CAUTION

A: Lo packed valve B: Hi packed valve
C and D are ends of indoor unit connection.

NOTE: The illustration is for explanation purpose only. The actual order of A, B, C, and D on the machine may be slightly different from the unit you purchased. The actual shape shall prevail.



A, B, C, D are points for one-four type.

Fig.69

Test running

Perform test operation after completing gas leak check at the flare nut connections and electrical safety check.

- Check that all tubing and wiring have been properly connected.
 - Check that the gas and liquid side service valves are fully open.
1. Connect the power, press the ON/OFF button on the remote control to turn the unit on.
 2. Use the MODE button to select COOL, HEAT, AUTO and FAN to check if all the functions work well.
 3. When the ambient temperature is too low (lower than 62.6°F), the unit cannot be controlled by the remote control to run at cooling mode, manual operation can be taken. Manual operation is used only when the remote control is disabled or maintenance necessary.
 - Hold the panel sides and lift the panel up to an angle until it remains fixed with a clicking sound.
 - Press the Manual control button to select the AUTO or COOL, the unit will operate under Forced AUTO or COOL mode (see User Manual for details).
 4. The test operation should last about 30 minutes.

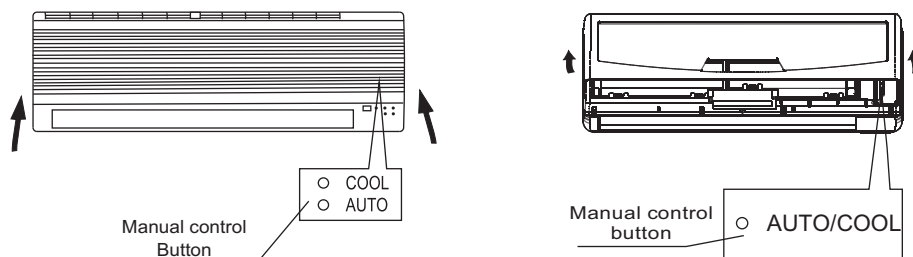


Fig.70